ERP correlates of pattern encoding dependent on the distracting visual background information

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Abstract: Background-dependent alterations in human brain activity during visual encoding were studied with event-related potentials (ERP) in healthy humans. The task was pairwise comparison of abstract patterns placed on 2 types of background: 1) personally familiar faces and 2) same blurred faces. Participants compared pairs of consecutive targets and gave a motor response. Data were collected with 128-channel EEG-system with the digitization rate of 250 Hz. We evaluated the effects of background during 1500 ms from the onset of the first image in a pair.

Large effects were observed in the left fronto-temporal (120 ms) and in frontal (140-200 ms) areas. Local background-dependent alteration in central area at 250 ms was followed by widespread differences until 420 ms, then concentrating on central areas till 1000 ms. The right temporal area showed even later changes. We demonstrate that attention acts on both target and distractor representations with specific temporal patterns.